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- (88) Date of publication of the international search report:  
31 December 2003
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHODS OF SYNTHESIZING INSULIN POLYPEPTIDE-OLIGOMER CONJUGATES, AND PROINSULIN POLYPEPTIDE-OLIGOMER CONJUGATES AND METHODS OF SYNTHESIZING SAME

(57) Abstract: Methods for synthesizing proinsulin polypeptides are described that include a contacting a proinsulin polypeptide including an insulin polypeptide coupled to one or more peptides by peptide bond(s) capable of being cleaved to yield the insulin polypeptide with an oligomer under conditions sufficient to couple the oligomer to the insulin polypeptide portion of the proinsulin polypeptide and provide a proinsulin polypeptide-oligomer conjugate, and cleaving the one or more peptides from the proinsulin polypeptide-oligomer conjugate to provide the insulin polypeptide-oligomer conjugate. Methods of synthesizing proinsulin polypeptide-oligomer conjugates are also described as are proinsulin polypeptide-oligomer conjugates. Methods of synthesizing C-peptide polypeptide-oligomer conjugates are also described

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/28428

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C07K 14/62; A61K 38/28

US CL : 511/3; 530/303

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
U.S. : 511/3; 530/303

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
none

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y, P	US 6,309,633 B1 (EKWURIBE et al) 30 October 2001 (30.10.2001), see entire document	1-17, 19, 26, 30-33, 38-42
Y	WO 01/21197 A1 (UNIVERSITY OF UTAH RESERACH FOUNDATION) 29 March 2001 (29.03.2001), see entire document, especially 7-10.	1-17, 19, 26, 30-33, 38-42
Y	US 5,631,347 A (BAKER et al) 20 May 1997 (20.05.1997), see entire document, especially column 2-3.	1-17, 19, 26, 30-33, 38-42
Y	US 4,179,337 A (DAVIS et al) 18 December 1979 (18.12.1979), see entire document.	1-17, 19, 26, 30-33, 38-42

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

27 July 2003 (27.07.2003)

Name and mailing address of the ISA/US

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Commissioner for Patents  
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# INTERNATIONAL SEARCH REPORT

International application No.

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## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claim Nos.: 18, 20-25, 27-29, 34-37, 43-49  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐  
☐

- The additional search fees were accompanied by the applicant's protest.  
No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

PCT/US02/28428

**Continuation of B. FIELDS SEARCHED Item 3:**

EAST, USPATFUL, WPIDS, CAPLUS, MEDLINE, EMBASE

search terms: insulin, proinsulin, insulin oligomer, peg, fatty, complex, conjugated, polyethyleneglycol.